PROFESSOR C. F. BAKER, of the department of biology of Pomona College, has resigned to accept a professorship in the University of the Philippines. He will be at the College of Agriculture, Los Banos, Philippine Islands.

THE Coutts Trotter Studentship at Trinity College, Cambridge, founded for the promotion of original research in natural science (especially physiology and experimental physics), has been divided between Mr. E. D. Adrian, B.A., and Mr. A. E. Oxley, B.A.

THE council of the University of Paris has elected M. Andoyer, professor of physical astronomy in the faculty of science and member of the council of the Nice Observatory, as successor of the late M. Henri Poincaré in the professorship of mathematical astronomy.

DISCUSSION AND CORRESPONDENCE

INSECTS CONTRIBUTING TO THE CONTROL OF THE CHESTNUT BLIGHT DISEASE[1]

INVESTIGATIONS during the summer of 1912 by the Bureau of Entomology have brought to light some very important relations of insects to the chestnut blight, of which one of the most striking is that certain insects contribute to the natural control of the spread of the disease by feeding on and at the same time destroying the fruiting bodies.

During the winter of 1911 the writer observed many cankers with the pustules eaten out and the diseased bark infested with small larvæ. Later adults of the species were reared from these larvæ, one a Cerambycid, *Leptostylus macula* Say, the other a Colydid, *Synchita fuliginosa* Melsh; both were observed while caged to eat the pustules and stroma, the latter even to eat conidial threads.

At the Forest Insect Field Station 9, Charteroak, Pa., an extensive outbreak of the disease was found where a large percentage of the pustules were eaten. Investigation showed both species to be present but *L. macula* doing most of the work. Other insects collected and caged were found to eat the pustules as follows:

Family Buprestidæ—*Agrilus bilineatus* Web.
Family Chrysomelidæ—*Bassareus pretiosus* Melsh.
Family Trogositidæ—*Thymalus fulgidus* Er.

A number of experiments were made by Mr. R. D. Spencer, of the Chestnut Blight Commission, working with the writer, in culturing the stomach contents and excrement of *L. macula,* but in no case did the spores germinate.

Following these observations, a study of the chestnut throughout its northern range showed the same conditions everywhere the bark disease occurred. In many localities 50 per cent. to 75 per cent. of the pustules were eaten. In some cases scarcely a single perfect pustule could be found on a badly diseased tree and in such localities there was evidence of a marked decrease in new infection.

The fruiting bodies are eaten cleanly and deep into the bark, both pygnida and perithecia being destroyed. During the last summer a perceptible increase in the destruction of the pustules by insects was noticed. This shows that they have acquired a taste for the fungus which points toward increased destruction of the spores.

These insects, though not checking the growth of cankers already formed, play a most important part in controlling the dissemination of the disease.

F. C. CRAIGHEAD
BRANCH OF FOREST INSECTS,
BUREAU OF ENTOMOLOGY,
U. S. DEPARTMENT OF AGRICULTURE

[1] Read before the Biological Society of Washington, November 16, 1912.

A POSSIBLE CAUSE OF ACCIDENTS TO AVIATORS

TO THE EDITOR OF SCIENCE: I think that your valuable paper is in a position to render a very important service in aiding to lower the death rate among aviators.

Probably if we knew all the causes of disaster we should see that they are of many kinds.

To mention only one of the possible causes, take the gyroscopic effect of the revolving-cylinder motor.

Among your readers there are very many

physicists who collectively have a wealth of knowledge concerning gyroscopic action. Suppose that twenty or more of these were each to write an answer to the following question, suppose that the answers showed substantial agreement, would not their words come with great authority and lead to a thorough investigation of the subject?

The question which I propose for discussion is this:

Is it probable that the gyroscopic action of a revolving-cylinder engine produces dangerous stresses upon the framework of the flying-machine?

Practical airmen are not in agreement in this matter. Some say that the gyroscopic action is negligible, others say the contrary.

If physicists and others who have studied the gyroscope will kindly respond to this suggestion, I will see that marked copies of Science are sent to the editors of the leading aeronautical publications of the world.

James Means

Boston,
November 22, 1912

THE PEDOMETER

To the Editor of Science: In glancing over some pages of the Encyclopedia Britannica (eleventh edition) recently I found a short article on the *pedometer,* the concluding sentence of which is:

> Obviously the pedometer is little better than an ingenious toy, depending even for rough measurements on the uniformity of pace maintained throughout the journey measured.

Two definite statements are here made, both of which are quite erroneous. When properly understood and properly used the pedometer is a most useful addition to the outfit of a traveler and an especially delightful and comforting companion to those who know the joy of seeing the world *à piede.* A cheap instrument (costing only a dollar) which I have carried almost every hour of almost every day during the past dozen years is still "as good as ever," registering distances with an accuracy that is really surprising. It has been tested over hundreds of miles and kilometers of roadway in England, Germany, Italy and Switzerland (especially in the last-named country, where on most highways every kilometer of distance is marked by a stone monument), and found correct generally within one per cent., the error rarely being as much as two per cent. *I have known government surveys not so good.* Such an instrument can hardly be classed with "ingenious toys" and the explanation lies in the fact that the remainder of the sentence quoted above is equally erroneous. With the right sort of pedometer within certain considerable limits the record is *not* affected by variation in length of pace. There are two sorts of pedometers, the right sort and the wrong sort, and unfortunately it is the wrong sort that is usually offered for sale. This is simply a "step counter" the figures on the dial showing the number of steps taken and it is necessary to know the average length of step to convert this record into distance. Aside from the great inconvenience of being obliged to make a calculation whenever one desires to know the distance travelled even this instrument when properly adjusted and calibrated ought to give fairly satisfactory results. But the right sort of pedometer is not a pace counter and the numbers on the dial show directly the distance traversed in miles or, if one has the good fortune to live in a country where reason prevails over prejudice, in kilometers. In this the movement of the registering mechanism is caused by the rise and fall of a kind of horizontal pendulum, the length of the stroke for each step and hence the distance registered being capable of adjustment. But when short steps are taken the pendulum does not pass through the whole arc of its possible movement and the distance registered is consequently less. Thus, as stated above, the movement of the index hand is proportional to the distance traversed and, within certain limits, is not affected by variation in length of step. This is a most important fact and gives to this form of pedometer a value evidently not generally known or appreciated.

Ravenna, Ohio, T. C. M.
November 11, 1912